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Designing with Demons: In search of living bricks in Estonia



EAG (Armstrong, Ferracina, Hughes), Grišakov

**Designing with Demons:**  
**In search of living bricks in Estonia**  
*A Workshop at TTÜ Academy of Architecture and Urban Studies*  
**By the Experimental Architecture Group**  
**(Rachel Armstrong, Simone Ferracina, Rolf Hughes)**  
**with Kristi Grišakov**



~~Unleashing~~Designing thewith ~~Demons~~Within:  
~~Searching for~~In search of ~~living bricks~~ in Estonia

~~A Workshop in Tallinn~~at Tallinn Technical University,  
by the ~~Experimental Architecture Group~~,  
(Rachel Armstrong, Simone Ferracina, Rolf Hughes)

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Rachel Armstrong  
~~Simone Ferracina~~  
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~~& Hannes Tönnisson.~~

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~~"And with the hieroglyph of a breath, I wish to recover an idea of sacred theater."  
Antonin Artaud, *Le Théâtre de Séraphin* (Damisch, 2002, p200)~~

"I'm learning to see. I don't know what it's about, but everything is registering  
in me at a deeper level and doesn't stop where it used to. There's a place  
within me that I wasn't aware of. What's going on there I don't know."

Rainer Maria Rilke, *The Notebooks of Malte Laurids Brigge*

~~"And with the hieroglyph of a breath, I wish to recover an idea of sacred theater."  
Antonin Artaud, *Le Théâtre de Séraphin* (Damisch, 2002, p200)~~

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## Introduction

by Rachel Armstrong, Simone Ferracina & Rolf Hughes

The present book gathers materials, methods and reflections stemming arising from a week-long workshop which was held at the Tallinn Technical University (TTÜ) 27-31 March 2017. The event was a collaboration between Kristi Grišakov, Head of the Landscape Architecture programme for the Interdisciplinary Landscape Architecture Master Studio, and the Experimental Architecture Group (EAG) from the School of Architecture, Planning & Landscape, Newcastle University, led by Rachel Armstrong, Professor of Experimental Architecture, with Simone Ferracina, Lead in Living Architecture, and Rolf Hughes, Director of Artistic Research Practices in Experimental Architecture, and Simone Ferracina, Lead in Living Architecture. The course featured guest lectures by Tiina Peil from the School of Culture and Learning, Södertörn University and Hannes Tönnisson, Institute of Ecology, Tallinn University, which aimed to widen the range of conceptual and practical tools through which participants could explore the role of design in shaping complex, hybrid human and non-human relationships in an era of ecocide.

With workshop techniques drawn from Experimental Architecture, a visionary practice that generates design methods, experimentation and the production of prototypes, students were invited to propose fundamental units of design and construction for the 21<sup>st</sup> century – “living bricks”. The term “living” in this context incorporates both the processes that underpin life and the principles whereby spaces invite ecological entanglement and inhabitation.

As a starting point, we observed that the construction of buildings in modern society deploys the same mechanical principles that are typified in Le Corbusier’s remark that buildings are “machines for living”. Since the late 20<sup>th</sup> century, however, the devastating environmental impacts of machines as agents of industrial systems have consumed natural resources so voraciously that toxic products like smog and microplastics, have now permanently entered our atmospheres and seas, while the build-up of industrial fossils in our garbage dumps are leaking toxins into the earth.

While this machinic trope originally aimed to improve the life of people living in overcrowded urban conditions (efficiency, hygiene, exposure to light and air, etc.), its partial failure coincides with the increasing awareness that the devastating negative impacts imposed on natural systems by industrial processes enacted through mechanical technologies can no longer be ignored. Indeed, the built environment is responsible for around 40% of our carbon footprint, stemming both from the way materials are mined and processed, and from the staggering consumption of fossil fuels within our homes and cities. These impacts are so severe that geologists around the world are now invoking the term Anthropocene to indicate the indelibility of the human mark on the natural systems that sustain us. It is now apparent that if we continue on our current trajectories for human development, we will be facing a grim 6<sup>th</sup> great



extinction, which is already evident from irretrievable losses of biodiversity and from permanent changes in the composition of the planet's fabric.

Even though we are in the mist of environmental disaster, we must urgently change our modes of inhabiting space, so that we can identify ways of living more coherently with the planet and forms of life grounded on facing the present difficulties (Donna Haraway's "staying with the trouble"), rather than simply ignoring them, or becoming paralyzed by despair.

Of course, global governments are setting targets to minimize the planetary "crash" that we are heading towards. However, to date, our attempts to build better homes and cities have largely focused on damage limitation exercises that seek to install more efficient machines, which are less damaging to the environment, rather than subverting the accepted paradigm whereby human occupancy is inevitably damaging to sites and ecosystems.

Experimental Architecture rejects the inevitability of environmental harm through the reinvention of our modes of development. It seeks ways of inhabiting the world that may increase its liveliness and fertility. Drawing from the principles of life, the experience of bodies, and from natural processes such as biofouling and bacterial metabolisms, this workshop aimed to radically re-invent the conditions for design by interrogating our approach towards coexisting with the living realm. In particular, we looked to the deep processes that produce soils and ecosystems through an appreciation of Earth's deep histories. In this manner, an alternative view of the relationship between human and nonhuman actors could be adopted that decenters humanity as the dominant agent of space making. By observing the natural processes that replenish the environment and sustain life in ways that are highly site/niche-specific, as well as by immersing ourselves in the contextual histories, memories and stories of Tallinn's sites, it was possible to imagine where symbioses with natural systems might be placed in response to specific challenges (environmental, historical, cultural) and ecosystems. By staging an encounter with particular sites (Hughes, 2013) and paying attention to the details of existing landscapes, the workshop asserted a positive role for design that upholds an ethics of life and embraces humanity's (humble)respectful stewardship of the living world.

Specifically, the workshop set out to develop prototypes for an alternative unit of design that addresses the challenges of the 21<sup>st</sup> century – an emerging ecological era where buildings (and their associated apparatuses) are capable of coping with climatic shifts, radical dislocation, and (rapidly) changing needs. These approaches are embodied in the design of this book, which in itself is an experiment, whose graphical format adopts a collector's perspective, the layout itself taking the form of a collection, so that the presented findings may be sorted, ordered and valued not only by the participants, but also by the reader.

To meet these challenges, participants were asked to visit a range of curated sites and to complete exercises in observation, storytelling, and attentiveness, gathering thereby materials that would be subsequently assembled in the studio



to form a “living brick.” Conceptually, this unit of design serves as a counterpoint to traditional building and manufacturing practices. Bricks are usually designed from devitalized chunks of earth, whose liveliness has been extracted in their processing. They are therefore homogenous and are characterized by a geometric self-similarity/modularity that aspires to perform a permanent barrier function that is belligerent to its surroundings. In contrast, living bricks invite the radical flows of life to participate in the design process, and they uniquely appear to have the capacity to work against the laws of classical physics. Indeed, James Clerk Maxwell made the ability of matter to contravene the inevitable decay towards equilibrium possible by conjuring the idea of a “demon” in his thought experiment that set out to explain how molecules might become more ordered in a closed system. The “intelligence” of the demon in sorting the molecules that could pass through a tiny trap door would be able to increase the order of the system and therefore violate the second law of thermodynamics.

The idea of the “demon” was used in the workshop setting to conjure the mysteries and rebelliousness of living things in finding techniques to produce order from chaos. While modern science has taught us an incredible amount about the world, it has by no means solved every conundrum – least of all the nature of life itself. Of course, “demons” were not literally summoned in this studio. Rather, the term invokes our interest in how living systems may enable us to design effectively and coherently in a disobedient world, so that we can better navigate their unruly forces. This requires particular attention to be given to the kinds of materials, methods, apparatuses and ideas that can be applied to imagine and work in unfamiliar and unpredictable spaces using a portfolio of tools that possess a degree of predictability but are also capable of unpredictable and creative behaviours that exceed our capacity to fully master and command. Moreover, the living brick prototypes invoked the mythologies of “place” and the peculiarities/multiplicities that characterize the interface between subjective experience, the inhabitation of space, and its choreography. Participants were asked to interrogate the radical materiality of each site using a particular exercise to carefully select local materials and harvest found objects. These objects became a starting point for proposing a brick prototype that discussed protocols for design, art and architecture in bringing together new conditions (and propel new ethical positions) for construction and inhabitation.

Using the toolset offered by Experimental Architecture, architects, artists and designers became narrators and conjurers capable of enabling the stories of everyday spaces to be played out and re-imagined through their actual materials, relationships and values – while encouraging alternative futures. By focusing on matter as a tool to channel and fuse human dreams and desires with the manifold and distributed layers, histories and agencies of a site, the workshop proposes that each brick prototype become a living thing, charged with an inner metabolic drive as well as a materiality that invites particular kinds of alliances and relationships. These prototypes may be thought of as apparatuses that assist designers and encourage them to resist the established truisms and expectations of modernism, which currently shape architectural and design practices. Living bricks conjure the conditions through which inhabited spaces could be (re)imagined in relationship with the natural realm – not as top-down geometric

blueprints but through encounters where many actors [contribute to the co-production of](#) events [and](#) spaces.

Using this approach, the city of Tallinn could be [viewed](#) as a fairytale, in keeping perhaps with Andrus Kivirähk's "Rehepapp ehk November", where the *rehepapp*, the wise man of the village – potentially the designer of encounters – possesses the know-how to help transform people's lives. While Kivirähk's story is built upon traditional forms of storytelling with demons and goblins, typical of Estonian folklore, [we share an understanding of](#) the unpredictability of the world, [which is deeply engrained in our design ethos. EAG remains committed to steering and tuning a reality that can never be fully apprehended or controlled, but rather nurtured and co-inhabited.](#) This workshop is not a step [back](#) into [the](#) Dark Ages, but [a](#) future-facing [and hopeful](#) pathway [towards living architectures, the](#) outcomes [of which](#) are as yet unknown.



## Visual Concept

By Simone Ferracina

Two images present the found objects collected on sites around Tallinn and combine them into a tableau of potential architectural ingredients, recasting them as materials for design. These images, which appear on the cover, are the starting point for the graphic identity of the book, and they constitute its visual matrix. Having been modified digitally to describe a simple figure-ground mapping, they are sliced to generate abstract page templates based on A3 and A2 spreads. This allows for the maximum degree of variety (no two pages are alike) within a rigorous and recognizable visual identity. More importantly, however, the templates thus generated extend/further/take up the ethos and methods of the workshop, translating them into constraints for the design of the book. In the same way that students were tasked with assembling units for the choreography of space out of (in dialogue with) the rocks, rusted metal sheets, twigs, discarded toys, mosses, key locks and glass fragments encountered (selected/collected) during visits to various sites to the west of Tallinn, so is the layout of the pages in this book constrained by the template outlines. A simple set of rules describes ways in which the *abécédaire* of found objects can be used in the configuration of images and text. In other words: having defined a new potential design alphabet, we develop the framework for the emergence of words and syntaxes by establishing a grey background for text boxes and assigning to figures (the profiles of the found objects) the duty of framing/cropping images, funnelling and extruding them through disfiguring shapes that distort the landscapes, materials and textures they depict, turning them into monstrous assemblages and hybrid agglomerations: strange, carnivorous objects that cannot be named. This visual system is not neutral ~~or acritical~~ in respect to the archive (to its own role as preserver of memories/artefacts); it does not espouse transparency and clarity as its guiding principles, traditional formats (*images shall be presented in distinct rectangular containers!*) or the presumption of fidelity—of a *correct* translation or transmission of the workshop's ideas and outputs. Rather, it promotes a durational and tenuous/troubled visual fabric that replaces the archive (a system of values that includes by fixing) with the on-going redesign of value and matter beyond the drive to enshrine, fix or instrumentalize.

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## Experimental Architecture

by Rachel Armstrong

The term “experimental architecture” first entered the architectural lexicon in 1970 when Peter Cook offered his critique of the stasis in Victorian pragmatism that underpinned the “materialist corner of the modern movement” (Cook, 1970, p30). Believing that architectural freedom of expression was compromised by dominant formalisms, Cook embraced the cutting edge of modern invention to explore how new kinds of emergent social order were possible by using new materials, computers, communication, transportation, plug-ins, plastics, prefabrication, portability, waterborne and airborne living.

Starting out as a postmodern ironic commentary on programmatic modern tropes and building techniques (Betsky, 2015), experimental architecture was not imagined as a techno-fix, but a medium for discovery through experiment of thematic tropes that moved design and society towards change.

During the 1980s, Lebbeus Woods took an uncompromising view of architectural agendas and used draughtsmanship as an experimental apparatus to reveal parallel worlds that proposed new roles for the architect, which engaged subjects previously uncritiqued by architecture ranging from natural disaster to warfare. He proposed radical new structures and spaces without walls, where the built environment was (re)imagined and (re)constructed, including its relationship with the biosphere – indeed, Woods was prepared to re-think the very planet if required (Manaugh, 2007).

Experimental architects now have access to a new set of technologies that are not confined to industrial paradigms and logical approaches to urban challenges but engage imaginatively with the natural realm. This can take place through advances in molecular biology that are choreographed through natural computing techniques in testable scenarios and experiments that result in an interrogative system of prototypes. These are predicated on shifting away from the traditional view of architecture as a static, form-giving subject, to protocols for choreographing space through “worlding”, which invites alternative modes of inhabitation and being-in-the-world (Armstrong, In press).

Experimental architecture also develops knowledge through *storytelling as transdisciplinary synthesis*, which becomes key not only to developing the scope of research itself, but also its capacity to link and connect forms of expertise previously kept apart (Armstrong, 2016), (Armstrong, Hughes & Gangvik, 2016) (Armstrong & Hughes, In Press a) (Armstrong & Hughes, In Press b), (Hughes, 2014), (Hughes, 2009b). Characteristically, experiments speak to transformative materialities that conjure invisible realms, embrace change, provoke uncertainty, take risks, create hybrids and are formed from hypercomplex materials like fur, soil and felt (Geiger, 2016). They also engage with the integration of research methods across disciplines, artifacts, performances, and encounters that explore the possibilities within specific sites that may present particular challenges such as being wet and soggy, or scarred by industrial fossils. Although the work is in



keeping with Cook's agenda of establishing alternative modes of living that disrupt tyrannical systems of order within urban spaces, technological platforms have less in common with industrial machines than with surrealism and fairytales– like Dalí's soft clocks, hairy materials, invisible forces, liquid environments, emotional landscapes and quantum phenomena. They also recognize and examine the participatory status of the body in these spaces, as an active (non-mechanical) agent that channels and evaluates architectural choreographies through site-specific modes of inhabitation. Indeed, experimental architecture understands our bodily experiences as an interface for understanding a site. Our senses enable us to take a site-specific, subjective, 'messy', and highly distributed approach to experiment that counters the modern condition of finding knowledge in pristine or privileged environments. Experimental Architecture therefore becomes an expression of design through performances in which the designer is immersed, which is evocative of Henri Lefebvre (Lefebvre, 2016) and Walter Benjamin's (Benjamin, 1999) subjective encounters with space. Importantly, when combined and interrogated mindfully, the portfolio of experimental architectural methods and apparatuses, retains the capacity to completely alter the expectations of our dwellings and the notion of what constitutes a body with its human, and nonhuman communities.

From these rebellious seeds and unpoliced spaces, disruptive modes of inquiry may further sustain and enrich our knowledge of an ecologically stressed planet. Such research methods imply a need for new evaluative criteria that do not aim for complete solutions or perfection but speak to established notions of research *quality* while respecting the specific characteristics of each disciplinary contribution. Such a daunting ambition to bring together so many different aspects of inhabiting and experiencing spaces that resist universal truths and deal with peculiarities and particularities of inhabitation is consistent with the ambition to transform the paradigms that shape the construction of our living spaces. Yet, whether the final project is completed within a single lifetime or not<sup>1</sup>, the journey itself produces rich integrative and synthetic platforms for fresh juxtapositions – and insight, which evades complete resolution and resides within the terrains of poetry, magic and monsters (Hughes, 2016a).

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<sup>1</sup> One of our works, the Persephone project, aims to construct a research platform for the design of the interior space of a starship within a 100 years (Armstrong, 2016).

## Matter and life

by Rachel Armstrong

"In the history of science and philosophy there is hardly a less happy expression than that of the *bête machine* of Descartes. No concept leads to such a distorted view of the problem underlying it, or so greatly falsifies its proper meaning. It might even be said that, in spite of its heuristic success, the notion of the machine has had a destructive effect on the development of biological theory. It has entangled the investigator even today with scholastic artificial problems, and at the same time has prevented the clear discernment of the essential problem of organic nature. Only the displacement of the machine theory [...] will put and end to the paralysis of biological thinking for which this Cartesian expression has been responsible." (Bertalanffy, 1933, pp.36-37)

In assessing the nature of the living realm, it is imperative to consider the frameworks and substrates through which it is imagined and constructed. During the 20<sup>th</sup> century, the ancient view of atomism, which proposes that reality is made up of fundamental particles, was given new perspectives when Albert Einstein mathematically proved in a simple formula, that previously indestructible atoms could be shattered to release incredible amounts of energy. Such developments unleashed the reality of the "spooky" quantum realm, which defied the simple causalities that shaped classical worldviews. For example, at the subatomic scale, particles could interact at great distances which seemingly exceeded the speed of light and therefore were mysteriously "entangled".

Yet, despite the advances in quantum physics, our scientific discourse about natural systems is still centered on a classical view of reality, which is framed by the machine metaphor. Indeed, machines embody a practical model of atomism, where hierarchically ordered objects stand in for atoms. This is the approach that we take to view and test the natural world. Objects, which perform the equivalent of atoms in a mechanical system, are irresistible apparatuses through which mechanical reality can be understood, designed and engineered as a working model of reality. Like a clock, or an orrery, machines not only denote the way that reality works in space and time through the choreography of objects – they also reveal the nature of things. This is communicated through the language of mathematics, which describes object relations geometrically, as universally transferrable patterns and trajectories. Equations therefore became deductive and predictive instruments that indicated how events might unfold, enabling researchers to sort, order and ultimately control their valued objects – and thus, the universe.

Although the mechanical metaphor has helped us understand many things about the natural realm, many puzzles and "demons" remain. While some of these, like the capacity for European robins to be able to navigate using very weak geomagnetic fields, may be attributed to quantum phenomena (Al-Khalili & McFadden, 2014), others, like the particle of gravity – the graviton –, remain undiscovered. Moreover, many natural occurrences such as the construction of



biofilms, or the coordination of embryogenesis, remain beyond the reach of simple causality and classical explanations and cannot be resolved entirely.

Indeed, even at the macroscale, once matter possesses its own energy, it is capable of expressing an innate complexity at far from equilibrium states. Under these conditions, time itself becomes a creative force by which substances can self-organize and complexify without the need for organizing codes or divine intervention. Indeed, Ilya Prigogine proposed that certain expressions of lively matter that he termed “dissipative” systems, underpinned the nature of life (Prigogine & Stengers, 1984).

‘Figuratively speaking, matter at equilibrium, with no arrow of time is “blind,” but with the arrow of time, it begins to “see”.’ (Prigogine, 1977, p.3)

Dissipative structures are paradoxical assemblages of matter. They challenge our expectations of objects, as they are simultaneously objects and processes. They form spontaneously when reactive energy/matter fields overlap and characteristically resist Newton’s law of increasing disorder (or entropy). Everyday examples include convection currents, turbulent flow, cyclones, hurricanes and living organisms. According to the laws of dissipative adaptation (Wolchover, 2014), which proposes that matter re-arranges to channel the flow of energy to become more effective at shedding energy and therefore persisting longer, these structures can dynamically alter their programmatic organization. This process extends well beyond the apparent object boundary and also impacts on its surroundings. Think of a tornado that can influence extensive landscapes through the winds it sets up long before a storm chaser might reach the eye of the storm. Consequently, by possessing a dynamic energy cloud, or aura, dissipative structures are not blind automata but demonstrate a kind of primitive subjectivity that is not only extruded into, but also responsive to, its environment. Such an extrusion of “being” that permeates perturbations within the environment constitutes a kind of “agency” that is not a primitive, centrally directed reflex that is typical of an automaton, but a body that is actively engaged in decision-making processes which take place locally at interfaces. Molecular interactions therefore are shaped by the transformations encoded in their spatial configuration and substance, but also by their context. In fact, matter can act and make decisions by virtue of its innate properties in response to environmental perturbations. Such processes do not reside at boundaries but infiltrate each other through the merging of clouds, fields and fuzzy zones in events that are not simple causes and effects, but possess a fundamentally meteorological character.

Although many primary dissipative structures collapse back into nothingness, once a chain of initiating events emerges (which happened around three and a half billion years ago on our planet in the story of life), then contingent spaces are also more likely to favour the probability and persistence of further lifelike events. These propagative conditions do not occur within the dissipative bodies themselves, but through ongoing field interactions. It is possible that the unique condition whereby dissipative bodies learned to contain their own reactive fields could have been one of the major initiating events for biogenesis. While not inevitable, these kinds of occurrences have persisted in many different forms on

earth, long enough to support the energetic and material exchanges between unbroken chains of organisms that enable spontaneous transformation and complexity to occur through the laws of dissipative adaptation. Indeed, dissipative systems are key infrastructures in the evolutionary story of our terrestrial community of life, which continue to link the webs of life and death in favour of our ongoing persistence and organic complexity (Armstrong, Ferracina & Hughes, In development).



## Living Bricks<sup>2</sup>

by Rachel Armstrong, Simone Ferracina & Rolf Hughes

The brick, as [a modular design unit for structural systems](#) has barely changed since its first recorded appearance in the temple of Gobekli tepe, Urfa, in southeast Turkey, 11,500 years ago. [EAG believe](#) that in an ecological era, [during which](#) our constructions forge dynamic encounters with nature, the humble brick – [a fundamental unit of iterative design](#) – must be reconceptualised and rediscovered for the 21st century. [Indeed, redefining the basic materials used in the construction of space implies a critical re-assessment of architectural values and toolsets. Rather than focusing on the ingenuous redesign of what a brick does, as seen in many contemporary architectural practices \(the mortarless installation of Jenny Sabin's \*Polybricks\*, the shapely arches of Greg Lynn's \*Blob Wall\*, the \*Flight Assembled Architecture\* by Gramazio & Kohler\), we asked students to help us reinvent what a brick might be. In other words: our inquiries refuse to obediently play within the parameters predefined by industrial orthodoxy \(efficiency, structural integrity, repetition, modularity, performance\) and aim to tackle a muddier and more fundamental question: what constitutes a brick? What are the fundamental units for the design and experience of space? The reframing of bricks in this perspective expands the ingredients and recipes whereby design is allowed to operate and empowers designers to be the drivers of technological change – the inventors of heterodox, ambiguous, idiosyncratic and partial teleologies that defy top-down chains of evaluation, technical processing and functional imposition. Yet the approach is not speculative, or relegated to the imagination, but strongly rooted in the ecologies and material histories of the sites visited in Tallinn. The workshop focused on the production of “living brick” prototypes that behave like interfaces capable of channeling the flow of a range of substances – from water and air to memories and emotions. Participants were encouraged to consider the quality of the architectural encounter that such “objects” enable, as well as the kinds of experiences that become possible when these elements start to work together and become a new type of “wall” \(Armstrong, Ferracina & Hughes, In press\).](#)

[Brick](#) prototypes were made [of materials collected from various sites around Tallinn and ranged](#) from [branches and mud to waste and discarded](#) objects. Each brick conjured alternative relationships [between these found materials, their points of collection, and the rich histories that underpin them](#) – stories that could ultimately benefit [community relationships](#) and establish new terms for coexistence with the natural realm, [where outcomes would be partially shaped by inhabitation. Participants were invited to imagine their](#) living bricks [as part of the story of an alternative future for the region, suggesting a sense of material continuum rather than a tabula rasa. What they found could](#) be choreographed

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<sup>2</sup> The term “Living Brick” is derived from the first prototype of the Living Architecture research project that aims to generate a structural system that can compute and choreograph the flow of matter as a unit of design that operates as an assembly of “metabolic apps”. The project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement no 686585 is a collaboration of experts from the universities of Newcastle, UK, the West of England (UWE Bristol), Trento, Italy, the Spanish National Research Council in Madrid, LIQUIFER Systems Group, Vienna, Austria and EXPLORA, Venice, Italy. The Living Architecture project began in April 2016 and runs to April 2019 (Living Architecture, 2016).

through spatial and temporal tactics linked with complex environmental influences, like pollution or colonization by microorganisms. The prototypes also engaged imaginatively with their site of origin and the wider Tallinn bio-region.

Since ancient times architecture has been likened to the body. The way we build reflects our attitudes towards nature and each other. Traditional load-bearing walls are made from communities of bricks, composed from rigid materials around which cladding systems accrete, and through which interior environments can be bound. These materials promise to resist the natural world (to keep it outside) and indefinitely maintain their integrity, on our behalf. For if the architectural body is immortal, then surely ours can be too. A built environment conceived as a hostile system of control and barriers between and within territories, is not only generating the spatial conditions for the disintegration of societies and ecosystems, but also establishes the (un)ethical principles based upon which they are dismantled. In contrast, an architecture founded on the principles of life, which rests on mutual thriving and negotiated exchange, embraces the ethical conditions for tolerant, diverse and fair communities. While technological advances in the natural sciences, advanced materials, computing, robotics and social media can help us establish new conditions for the production of integrative spaces, it is naïve to assume that such diversity can exist without disagreement, or conflict. By seeking out the principles and techniques that embody the broad resilience and functional plasticity of nature's structuring systems and connecting them with the stories of places and the value systems of their communities, we may have a chance to thrive alongside our neighbours – including the natural realm, even in the face of adversity.

EAG have discussed this in the context of accordingly proposed an alternative to the proposed Trump barrier architecture situated wall between the United States and Mexico for the The Architectural Review. A wall may not behave like a wall if it is, in fact, alive... - (Armstrong, Ferracina & Hughes, In press).

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## On the “life” of stones

by Rachel Armstrong

There is no classification system for non-biological, yet lifelike agents with respect to their role in the living realm. Despite this exclusion, mineral growth and propagation are essential to the diversity of life on earth in producing organs such as teeth, bones, shells and the infrastructure upon which organisms thrive such as coral reefs. While stones can be understood as inert structures that are passively moved by lively forces in the environment, these choreographies invoke environmental agency, which narratively may be understood as characteristics of living things, or the influence of “demons” that appear to contravene the classical laws of physics. Indeed, Carl Linnaeus’ original taxonomy of natural systems – animal, vegetal, mineral – attributed stones with lively characteristics. For example, he proposed that sand particles grew by aggregation to become sandstone and that quartz was produced by a ‘parasitic’ mechanism. While Linnaeus’ view may seem outmoded by the standards of modern science, throughout the ages stones have been observed to move in unexpected, and complex ways. “Trovants”, or living stones, are unusual geological formations that are agentised during wet seasons, and can be found near the small Romanian village of Costesti (Murgoci, 1905). These are mineral formations composed from layers of cemented sand and salts that are arranged in ring-like formations, like the trunk of a tree. After every rainfall they are said to grow and rise from the ground. They may even multiply and move from one place to another. While it is rumoured that they are “inorganic” forms of life, it is likely that physical forces cause their liveliness. When saturated, their internal osmotic pressure rises and causes the rock to grow from the centre to the periphery, increasing its girth, which alters its presence on a site. The flow of water through the stones causes the formations to increase in size, with a deposition rate of about 5 cm in 1000 years. More recently, large stones have been tracked by GPS sailing across Death Valley. This phenomenon has been attributed to the temporary formation of frictionless surface tracks of ice, which enable stones to move significant distances from pressures exerted on them by a slight breeze (Stromberg, 2013). Yet, although stones are not alive in the way that organic matter proposes to be, inorganic matter is still capable of participating actively in the construction and development of natural systems – albeit through different ways than the organic realm. Organizing matrixes like clay and sulphide rocks, are especially likely to have played a significant role in biogenesis (Cairns-Smith, 1987). Indeed, living bricks not only challenge our expectations and definitions of life as it is understood at the start of the 21<sup>st</sup> century, but may also become agents in a broader realm traditionally ignored by design practices: the biogeosphere (Vernadsky, 1998).



## Stone Poetry Conversations with Mud

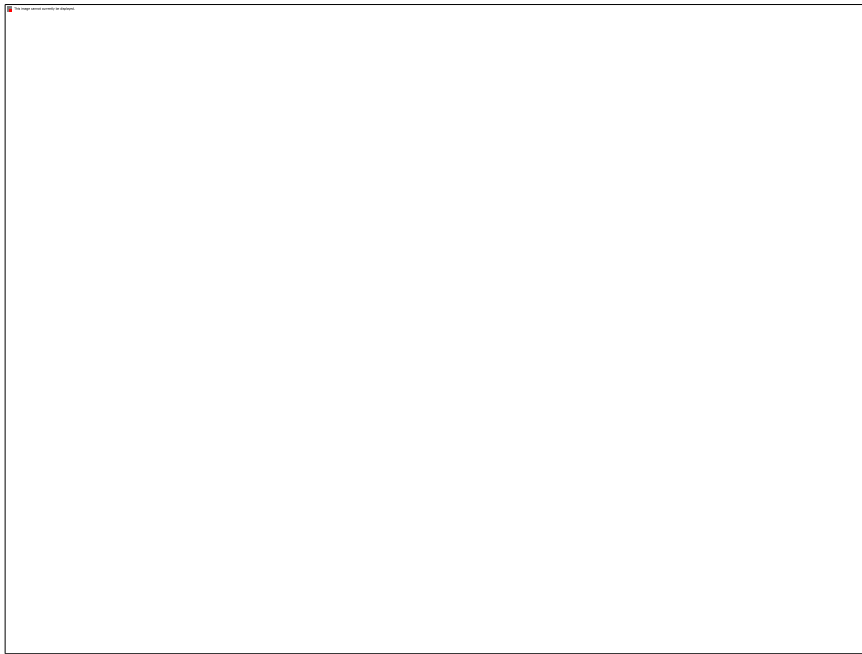
by Rolf Hughes

"A stone is an impressionistic diary of weather, accumulated by millions of years of disasters."

Osip Mandelstam

What is nature? What does nature mean to you? How should we relate to our beaches and coastlines? What would life be like for you if it were an hourly source of amazement? Instead of accepting the fatalism of the Anthropocene, what might an alternative *architecture of enchantment* mean for you?

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Stroomi beach. "One should remember that the coast is like living organism, it is not a static object. Coasts may change from day to day, from minute to minute, from wave to wave." Hannes Tönnisson, Photo: Rolf Hughes.

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We start to think through such questions by considering some very humble building blocks such as stones, pebbles, mud. The pebble in Zbigniew Herbert's poem "Pebble" (1968) may seem insignificant but is described as "a perfect creature" – "equal to itself/mindful of its limits" and possessed of a scent "that does not remind one of anything/ does not frighten anything away does not arouse desire". It is "just and full of dignity". The poet nonetheless experiences

"heavy remorse" when holding the pebble in his hand, knowing that "its noble body/is permeated by false warmth". The pebble would appear to resist the poet's impulse to appropriate and transform it into poetry – it remains a simple pebble and yet, simultaneously, it has become a poem (a poem about its apparent imperviousness to the poet's desire). An interface emerges, linking human and inanimate, or a paradox – the form that celebrates seemingly impossible coexistence. The poem's conclusion would seem to suggest the pebble's triumph:

--Pebbles cannot be tamed  
to the end they will look at us  
with an eye calm and very clear.i

And yet the poet's gaze is now returned – the quality of care and attention has seemingly animated the pebble's "ardour and coldness" and drawn forth, even in the moment of renouncing such a possibility, its "pebbly meaning" which thus enters the realm of poetic meaning while remaining "pebbly" i.e. unarticulated in human language.

Wisława Szymborska's "Conversation with a Stone"ii (1998) articulates a repeated request by poet to stone to "enter your insides/ have a look round,/ breathe my fill of you." The request is repeatedly refused in turn by the stone – "I'm shut tight/Even if you break me to pieces/we'll all still be closed./You can grind us to sand/we still won't let you in." Neither curiosity, imagined palaces nor bathetic appeals to the poet's mortality grind down the stone's resolve – "I'm shut tight./Even if you break me to pieces,/we'll all still be closed./You can grind us to sand,/we still won't let you in."

In the final stanza the stone refuses poetic conceit altogether, bringing thereby the poem to an abrupt end (unlike Herbert's earlier "Pebble" no accommodation is reached – poet and stone remain implacably 'alien' each to the other):

I knock at the stone's front door.  
"It's only me, let me come in."  
"I don't have a door," says the stone.

And yet language itself is a form of threshold – that poet and stone are able to speak to each other at all constitutes a form of portal, permitting the exchange of perspectives, positions, experience.

I introduced these poems at the outset of the workshop as a means of inviting participants to enhance their receptivity to their surroundings – to look at the inanimate as if endowed with will, history, proclivities, character, attitude. How might we help our living bricks 'speak' when we encounter them? Likely, we will first need to learn to *listen* attentively. During the week, therefore, we would develop a *poetics of receptivity* (which might more aptly be described as an *ethics of receptivity* – treating our found materials with the care, attention and

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respect they deserve – resituating them from the category of “trash” to the role of prototype or even artwork).

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On discussing these ideas with Rachel and Simone, I learned that stones may be living creatures, able to breathe, move, and exert influence on a person’s health and fate. There were even geologists studying this – Arnold Rhesar and Pierre Escollet from France – who had arrived at the “amazing conclusion” that stones are possessed of a kind of vital activity:

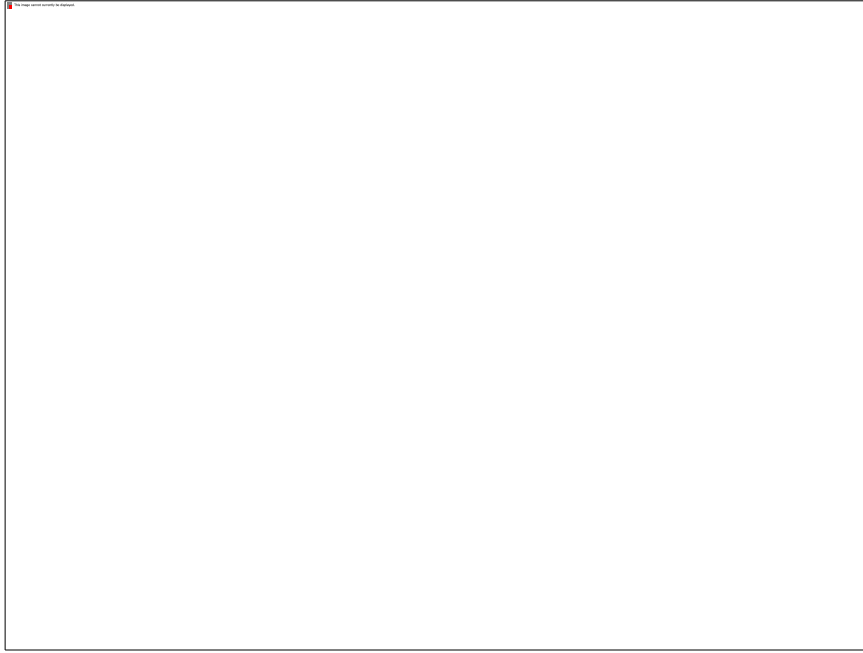
The geologists maintain the structure of stones is subject to changes, and stones can grow old. Moreover, the French claim stones can breathe, to a certain extent. Taking one “breath” takes them from three days to two weeks. And each of their “heartbeats” lasts about three days. The scientists say they gathered photographic evidence clearly indicating that stones could move. The pictures of stones were taken at large intervals. One of the stones is reported to have moved for 2.5 centimeters in two weeks’ time. The geologists stubbornly maintain that stones are living organisms though some physical processes relating to earth shove or water impact seem to be the most likely reasons behind the phenomenon.

“We can assume that any object in our world is alive,” says Marianna Anisosyan, a therapist and expert in biological energy. “Any event is driven by energy, which stones undoubtedly possess too. Every stone carries a certain amount of life in it,” she adds (Grachev, 2006).

And so I started observing stones not merely as geological artefacts, but as dancers engaged in a form of choreography at a pace almost imperceptible to my human senses.

You cannot release such energies and not expect consequences.





Bathing rocks, Türisalu beach. [*The rocks mimic the behaviour of tourists – but at a scarcely perceptible pace.*]  
Photo: Rolf Hughes

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### Mud face/face mud

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Mud exists as brick only until life reclaims it.

Here, in this artificial place, bricks are assigned to live with no water. They rise misshapen from the swamp, bent on defying nature, and are delivered to me when they malfunction. Because they invariably malfunction, I get to pass each day listening to their stories while I patch them up.

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The purpose of most buildings, they say, is to negate decay. If we were to sacrifice buildings, we might *celebrate* decay.

Those that can't walk need to be carried by water, soil or ice. Once they are with me, I take care of them the best I can. But they are always impatient to return to whatever broke them in the first place.

And so I summon the relics – the stories they clasp in their burnished gloves, their glimmering existence betwixt matter and spirit.

You cannot, I am told, release such energies and not expect consequences.  
This is why I was obliged to sink my face in the landscape and leave it to the  
soils' gnawing computations.

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Mud face

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– today, it gazes blankly back, radiating rivulets, rivulets inscribing skin  
contours, contours of what? this fusion of biology and geology? this slow  
death? this –

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face mud.

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## Seascapes: The poetics and actuality of living at land's edge

by Tiina Peil

Estonia proudly declares its maritime border to be more than 3800 km long but despite the physical vicinity of the sea, relationships between the people and the sea have never been easy. The history and culture of living on the coast and with the sea found inspiration in Édouard Glissant's poetics of relation (Glissant, 1997) and Marion Shoard's call for exploring edgelands (Shoard, 2003) – familiar yet ignored (unacknowledged) spaces which are neither city or countryside, natural or cultural, land or water. These spaces have remained largely unexplored 'wastelands' and thus unvalued. The Estonian north coast by the Gulf of Finland, more particularly, the Tallinn bay and Pakri peninsula, are sketches of specific coastal places. Such situated particularity is both grounded and mobile and includes the actuality of living by and with the sea and their reflections in poetry, arts, maps, and legends, finding its expression in a narrative atlas of seascapes in a sense promoted by Denis Wood (Wood, 2010) and Rebecca Solnit (Solnit, 2016; Solnit, 2010; Solnit, 2003).



## Mythical sSeaside

~~talk~~ by Hannes Tõnisson

Estonia is located in a transition zone between the regions with maritime climate in the west and continental climate in the east. It is very sensitive to climate change. Although Estonia is a relatively small country (45 227 km<sup>2</sup>), it is rich in different shore types and valuable coastal ecosystems. This is due to its geographical location in a transitional area between major geological structures and comparatively long coastline (nearly 4000 km) due to numerous peninsulas, bays and islands (around 2000 islands). Coastal evolution in the Tallinn region is influenced by land uplift (around 2.5 mm in Tallinn), waves and related sediment transport (long-shore and cross-shore transport), storm surges (up to 150 cm in Tallinn) and sea ice (protecting the shore during the winter and attacking the shore during break-up and melting).

There are seven different shore types in Tallinn Bay region: Artificial shore (harbours and coastal defence structures) cliff shore, sandy shore, silty shore, till shore, scarp shore and gravel shore. Coastal squeeze is an increasing problem in Tallinn (increasing pressure from the sea and from the land).

The main problems related to the shores are usage of unsuitable protection measures against erosion, usage of non-natural construction materials in the zone where the sediments are extremely mobile (moved by the wind or waves) and constructing too close to the erosional scarps or constructing in too low elevation (inundation). Such actions disturb natural balance of the shore and reduce their resistance against storm waves and storm wind. Moreover, in a longer perspective, such actions might cause large economical losses in the future.

One should remember that the coast is like living organism, it is not a static object. Coasts may change from day to day, from minute to minute, from wave to wave. All the actions in this zone must be carefully considered and where possible, natural processes should be followed.

~~The Tallinn lagoon is bordered by a range of shoreline types, from natural sandy beaches to concrete stone constructions that shatter the shallow tides. Yet it is the extreme weather that presents the most challenging assault to the land, shifting its extensive shorelines through the relocation of the ground by the churning currents and moving rocks around the lagoon's black water expanses like the hands of a geological clock.~~

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## Site Selection

by Kristi Grišakov

The studio was centered on the Tallinn Lagoon – a restless environment between land and sea. A range of sites was surveyed that examined the particular and peculiar details of the lagoon's terrain, and considered the most challenging architectural ideas and opportunities for experiment. From these places we collected samples of earth, recorded sounds and made automatic drawings, so that those qualities which are not the focus of traditional architectural surveys, became evident. Using storytelling techniques, we searched for a site's 'voice' and 'character' using methods that spoke through multidisciplinary voices, which saturated our senses – touch, sight, smell and even taste. During this process, participants became designers that wielded a *poetics of receptivity* to these chosen sites: the Männiku quarry, the Pääsküla bog, the Rummu quarry, the Keila-Joa park and falls, the Türisalu cliff and beach, the Stroomi beach, the Kopli housing area and the Katariina pier on the Paljassaare peninsula.

All the selected sites are characterized by water as one of the central elements of the landscape. Each was chosen both for its geographical closeness to Tallinn, as well as the ability to showcase an array of water landscapes in North-Estonia. The Pääsküla bog water is characterized by black shimmering hags, which are naturally occurring drainage channels, and man-made canals that intersect the territory. The Männiku and Rummu quarries feature deep blue lakes. At Rummu, the limestone surface transforms the water into a turquoise blue Caribbeanesque beachscape that is juxtaposed with the savageness of the surrounding landscape and the ice-cold temperature of the water. The core element of Keila-Joa is natural falls – water gliding along layered limestone surfaces and rushing towards the near-by sea. Türisalu cliff offers a majestic view to the calm Gulf of Finland. When one climbs under the cliff, the geological layers that make up this imposing viewpoint (and their fragility) are revealed. While the beach under the cliff is stony and freezing, it is transformed into a sandy and sunny hideout after escaping from its shadows. The sites in Tallinn offer a variety of beaches that display the three different types of bays and shorelines that make up Tallinn's long waterfront. Stroomi and Paljassaare are both classical sandy beaches with sand dunes, playgrounds and views to the panoramas of Tallinn. In contrast, the stony Kopli seaside offers no views to the surrounding urban settlements and lies truly at the edge of the city. A departure point to an unspecified future.

A common trait to all the chosen sites is that they have all been mutilated by human activity. In some, such as the Männiku and Rummu quarries, the whole landscape was turned inside-out in order to excavate sand, limestone and local marbles. Other sites such as Keila-Joa falls, Pääsküla bog or Türisalu cliff are changed by the gaze of tourists – framed and tamed into a purposeful aesthetic form. All the sites, with the exception of the Kopli housing district, are actively used as recreational areas for walking, swimming, camping and water sports. Even the sites that are closed to the public, such as the Rummu quarry, remain heavily used due to our natural desire to be close to the water and to jump into

the unknown.

Many sites also share an intrusive military heritage or presence. Männiku quarry still operates as a military training area with a shooting range just next to one of the lakes used for water sports. The Rummu quarry is lined by a neglected and vacant prison whose inmates were the original quarry workers and still inhabit most of the local parish. The Paljassaare peninsula was a closed military zone throughout Soviet times, cutting off all access to the sea. Reminders of this military past can still be found throughout the natural reserve, in the form of various defense structures, where birds and boars now prevail.

Some urban sites such as the Stroomi beach, are surreal. Stroomi is located between an asylum and a hippodrome on one side and an industrial area on the other. What remains in the middle is the Soviet era high-rise housing district, which is mostly populated by the Russian-speaking minority. This white beach with natural sand dunes has therefore become part of the local residents' 'backyard' and is thus intensely used. In stark contrast to the ever-vibrant Stroomi beach, the Kopli housing area has seen all life ~~sucked out of~~ ~~evacuated~~ and depleted. Yet it is no less surreal. An apocalyptic site, it has been vacated suddenly ~~and raising great indignation on the part~~ – much to the chagrin of its former inhabitants.

## The Fifth Season

by Rachel Armstrong

The site surveys were conducted during the fifth season, a time when frozen ground begins to thaw leading to an outpouring of water and an outlandish blossoming of life that bursts suddenly into spring. However, this is no catastrophe; the fifth season is a regular hydrological event, mostly occurring between the end of March and the beginning of April, where meadows, fields, forests, roads and even houses are flooded. With this great weeping, the flat and swampy landscapes of Estonia are saturated and many small streams overflow their banks, raising ground levels by as much as five meters. Such great volumes of water have the potential to shift the direction of rivers between the two largest lakes: Peipsi, situated on the Russian border, and Võrtsjärv, in Southern Estonia. In mythological terms, land is said to move when it is unhappy, reflecting the dramatic changes affecting these particular areas.

The drama of the fifth season, with its capacity to suddenly flood the land, is embodied in the periodically rising spring that feeds the Tuhala Witch's Well, which is part of an underground river in the Tuhala karst region of the Nabala-Tuhala ecological reserve. During most of the time the well appears quiet, but at times of high water, following particularly heavy rainfalls, or during the fifth season melt, the "disappearing geyser" suddenly erupts with swampy brownish fluid, which reaches a speed of 100 litres per second – or more – and can last for up to several weeks, flooding the surrounding area. The cauldron-like effect is one of the most unique natural phenomena in Europe, and folklore attributes the phenomenon to the witches of Tuhala, which are said to "whisk" themselves inside the well. Gathering in the well's underground sauna they beat each other vigorously with birch branches, oblivious to the commotion they create on the surface (Visit Estonia, Not dated).

Perhaps the most dramatic landscape changes during the fifth season are witnessed in the Soomaa floods, which may last a few days to a month, and are caused by the discharge of many small streams into narrow basins with low-lying terrains. Floods are particularly frequent in the lower reaches of the rivers Navesti, Halliste, Raudna and Lemmjõgi, since drainage is also hindered in this area. The Riisaküla flood area, which covers more than a hundred square kilometres, is the biggest in Estonia and affects the neighbourhood of the Riisa village, where water level rises can reach five and a half metres, although a couple of metres is more common. During the fifth season, people move over the flooded land by boat, or *haabjas*, which are traditional canoes dug out from aspen trees using a handheld adze and waterproofed with a coat of pine tar. It is also possible to trek through the flooded terrain using special bog shoes, which resemble snow shoes, to find bears, lynx, rare migratory birds and strange bog plants (Soomaa, 2017).

Yet during the modern era, this particular season has been "hidden" from cities and larger settlements, owing to the development of drainage systems.



Even within cities, where ice has cryogenically constrained the earth for months, its sudden release invites an almost audible gasp of flourishing as the plants soften under the bitter sunlight.

## Sensory landscapes

by Rachel Armstrong

Participants in the site visit were invited to identify objects, substances and atmospheres using a range of collecting systems like photography, drawing, prose and gathering, that would therefore contain the relationships they wanted to invite into the site, or would repel harmful agents. While some materials, such as the ever-abundant moss, possessed literal significance in relationship to their sites, other samples were of symbolic value, like newspaper clippings that stood in for a set of desired events and long-lost properties. These ecologies, events, memories and histories were given a role, and a voice, in the production of living bricks. Participants were invited to pay particular attention to sites using all their senses, so that the character of spaces could be revealed without being prejudiced through our habitual preference for visual cues.

### Automatic drawing

Participants were invited to pay particular attention to sites using all their senses, so that the character of spaces could be revealed without being prejudiced through our habitual preference for visual cues. Using their bodies as instruments to uncover invisible terrains and occult architectures within the sites, techniques of automatic drawing captured the sensory landscapes as marks upon paper. These mappings invoked the phenomenology and language of weather fronts, rather than the precise coordinates of geostationary satellites, and captured specific moments in the subjective experience of a place, whereby the colour of a pen, the grain and shape of a line, and other such details and traces become significant (they begin to signify) and therefore readable only after the encounter, rather than being intelligible during or integral to the composition of the drawing itself.

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### Sound of the ground

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Like birds searching for worms, microphones placed close to the earth recorded its sounds for a minute in walks staged at three personally significant moments. These devices became listening posts for the sounds transmitted through the soil, a terrestrial communications system already spun by mother trees that nurture and govern forest earth through networks of fungal roots, microbes and young plants, which resonated with the sound of melting ice.

While the gaseous landscapes of nature usually scream with all kinds of specific noises – birdsong, wind, rain, diesel engines and creaking tree branches, which create an ever-present background rumbling in the open – the thawing ground plays a unique symphony. As the ground is warmed, the cryogenic silence is broken and minute air bubbles that have been trapped in an icy matrix are released as tiny explosions. As the melting progresses, more air pockets are released and can be heard as splinters of invisible footsteps upon the ice, which herald the cacophony of spring.

## The art of gleaning: Workshop methods

by Rolf Hughes

### Glean

verb

1.

to gather (something) slowly and carefully in small pieces  
to glean information from the newspapers

2.

to gather (the useful remnants of a crop) from the field after harvesting  
Collins English Dictionary. Copyright © HarperCollins Publishers

The workshop asked participants to present on the final day three items: a prototype of a living brick (a “brick” here understood not as a barrier but as a device for reconsidering the potentials of living); a drawing (which might be a site map or a rendering of the prototype); and 100 words written about your brick – not to ‘explain’ or justify it, but rather to bring us closer to the experience or the values that the living brick embodies. Our site excursions were followed by material feedback and writing support as students worked towards these aims.

After an introduction and a morning of lectures, on the afternoon of the 27th March 2017, we set out via a hired minibus to our chosen sites in and around Tallinn. Our second excursion took place on 28<sup>th</sup> March (a full day). Equipped with sturdy walking shoes, camera, notebooks, sketchbooks, recording devices, we visited the following sites:

27 March  
Pääsküla bog  
Männiku quarry

28 March  
Rummu quarry  
Keila-Joa park and falls  
Türisalu cliff and beach  
Stroomi beach  
Kopli housing area  
Paljassaare peninsula - Katariina pier

on artistic research methods

Participants were invited to approach each environment as a living body. It was proposed that both the poems we studied (Herbert’s “The Pebble” and Szymborska’s “Conversations with a Stone”) were concerned neither (exclusively) with *essences* (material) nor *intention* (the poet’s will), but rather with *the construction of an interface* – an *encounter*, an *unfathomable dialogue* between animate and inanimate. Participants were asked to make and cherish a brick – a brick that will reflect and express you, that will be your offspring – a puppet, a golem, an auto-biography, a self-portrait.

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We would be drawing on methods from performance art and poetry to develop a poetics of receptivity during our visits. This means exercising care and attention in relation to our surroundings – awakening all the senses, fondling details, stopping still to inhabit an enchanted moment or two, bringing a dead artefact back to life through respectful curating allied to the transformative forces of desire, recontextualising, and (without wishing to over egg the pudding) love. We would use exercises involving attention, repetition and duration, some of which I had explored with Gustav Broms, Swedish conceptual performance artist and a lecturer at the Royal College of Art, London, during a memorable workshop titled “Meeting Body” (3-4 May 2016) in Vendel forest near Uppsala in Sweden (the workshop explored issues such as the dominance of sight in human thought and action, and how to experience time, duration, repetition and space through the body using all our senses).iii

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The following assignments were given for each site (time constraints sometimes curtailed the full assignment):

#### Pääsküla bog

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During an extended walk across the bog, participants were asked to gather (photograph, note, draw, remember) examples of “exceptions”: what seems out of place in the landscape? What might not ‘belong’?

#### Männiku quarry

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Walk.

Explore.

Surrender yourself to the site.

What happened on the walk?

What attracts you in this environment?

Return to a spot that attracted/struck you.

What this spot gave you was a gift: now give something back.

Describe this exchange.

#### Conversation in the woods

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What can I give you?

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I give you my care.

I give you my attention.

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But you are unmoved by such gifts.

You will grow – strong, tall, healthy – anyway.

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I give you my human contradictions, the games of my so-called intelligence, my unceasing capacities for polluting.

You are unmoved. You barely move.

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I give you understanding, nutrition, a lover's embrace.

None of which you either need or want.

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I could hang myself from you – give you my flesh.

You would wear your new, bone-white necklace with indifference.

What can I give you? A song of silence?

The shadow of my mute supplication?

Should I carve my questions into you to learn you a lesson you'll never forget?

"It's love that you can give me.  
Only that and nothing else."

I sought out a fallen tree, the first in a series of fallen trees, which had formed a significant obstacle on my walk, forcing me to clamber over branches. The nature of the obstacle struck me. I tried to return to it, but without success.

I then returned to a different site, a site where I had sat and written the above lines. While sitting on another fallen tree, I noticed A. wedge herself between two forking tree trunks. I thought at the time it takes a person trained in movement to insert the body into the landscape in this way, rather than stand or sit apart and simply observe it. I wanted to experience the tree, and also the moment of my writing that had passed, viewed from A.'s former perspective.

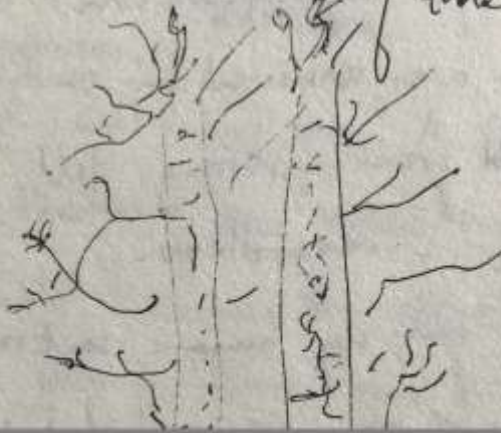
I put myself into the tree. It was tighter than expected. It squeezed my shoulders almost painfully. I wondered how A. had seemingly fit so snugly – was I so much broader? The tree was hugging me in one sense, which felt vaguely reassuring. But I also realised that if I stayed in this position for tens or hundreds of years, the tree would mercilessly crush me to death.

What the site revealed, then, was that an act of tenderness can be simultaneously an act of destruction, depending solely on the scale of time involved.

Rolf Hughes←

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crush me to death. What the site  
revealed then was that an act  
of tenderness can be simultaneously  
an act of destruction, depending  
solely on the scale of time involved.



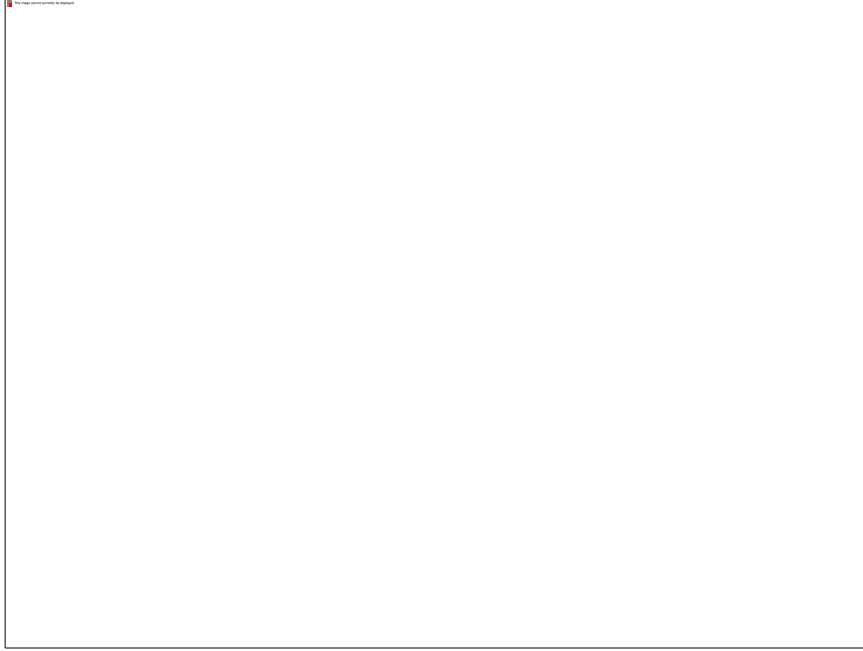
Rummu quarry

Find and collect different types of materials (different textures, consistencies, shapes, colours, etc.)

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Angelus Novus, Rummu quarry. [Look for the presence of other worlds, especially through water and reflections – “scrying”, Rachel Armstrong]  
Photo: Rolf Hughes

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▲  
Keila-Joa park and falls

Participants were asked to explore the *principle of three* in storytelling (a beginning, middle and end; three attempts to solve a problem; three bears, siblings etc.). You are asked to make a selection of three elements (photos, sketches, smells, audio recordings, details observed etc.) that allow you to tell a story about the site. If you opt for audio recordings, record exactly one minute of sound in three different locations. Through curating and juxtaposing your found materials, you will construct a narrative of place.

Türisalu cliff and beach

Collect objects that tell a story of the site. Through curating and juxtaposing your found objects, you will construct a narrative of place.

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Stroomi beach

Participants were asked to register their experience of the site (which was very cold and windy on the day we visited) through *automatic drawing*; draw or otherwise mark your impressions without looking at the sketchpad or evaluating your marks until the exercise is complete. Let the body produce its own graphics without the intervention of visual judgement.

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### Kopli housing area

We are at a crime scene and you are the detective. Sift the evidence – the discarded possessions, the interiors scattered in the rubble, the torn and burnt print blowing in the breeze – and try to reconstruct the lives of some of the people who lived here. What motivated them? What were their dreams? How did they relate to each other? Why did they leave?



Photo (Kopli): Rolf Hughes

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[Photo \(Kopli\): Rolf Hughes](#)

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Dented electric heaters with plastic log fire surrounds were tossed onto the white slabs of freezers and refrigerators; cookers and car fenders provided the ballast for angle-poise lamps jutting at crazy angles; office swivel chairs, junked televisions, bicycle frames, crutches, rusting plugs by the score, Moulinex with shattered bowls, tumble driers, flowery three-piece suites with stuffing erupting, window frames, flex galore, buckled wheels and seized-up jacks, toasters, splintered vinyl, black sacks, combs, spectacle frames, shelf units, shower units, kitchen units, sacks of plaster, threadbare carpets, coshed slot-machines, watches, paperbacks, paperclips, flakes of dandruff on torn donkey jackets; a million shards of history shed by a thousand shattered families, stacked and glistening in the rain-washed starlight.

“This is it,” Ella said. “Home sweet home.”iv

Paljassaare peninsula - Katariina pier

Our last stop. You were asked simply to discover what the site suggests to you.

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*Red, white, & blue. Katariina pier.*  
Photo: Rolf Hughes

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## Collections

by Rachel Armstrong

To compute is to sort, order and value the world so that knowledge may be acquired and updated.

While in the late modern era, our notion of computing has been equated with the digital platform – a symbolic, universal system of counting – the practice itself is ancient and can be evidenced in stone and bone tallies in prehistoric sites. Indeed, it was regarded as a divine feminine attribute four millennia ago (Chatelin, 2012, p1). Abacuses, Napier Rods, rosary beads, water computers and logarithmic tables, all became instruments of computation, which have shaped the way we produce the conceptual and value-based frameworks upon which we make our cultural references.

Yet, before we can count, we must ask what we are computing. Already there is a valuing system in place. Since the Enlightenment we have counted objects, which may be readily described in geometric terms. Yet not all experiences and events are computable using numeric systems based on real numbers. Indeed, Françoise Chatelin proposes that hyper complex numbers with functions beyond language possess an “organic intelligence”, with a unique logic that differs from classical logic (Chatelin, 2012, p547). Even Alan Turing, the founder of computer science, was interested in the computational processes of Nature (Turing, 1952) which uses a material system of iterations through which molecular “decisions” are made (Armstrong, In press).

In analogue systems like the living world, the computations are embodied and material iterations perform the role of numbers. Yet they are not symbolic like mathematics, which is also a universalized convention; they are actual and exquisitely specific to their contexts. Natural computing is universalized – in that it occurs everywhere there is matter at a far from equilibrium state – but it is not universal, or exactly repeatable wherever it takes place. Examples of natural computing are iterations, or beats, of real events such as a pulse, blink, footstep, bowel contraction, tide, or rain. These are not exact, self-similar, regular, or universal, but are nonetheless persistent phenomena. These computations are performed by atoms and molecules at far from equilibrium states, which are in constant oscillation at the atomic scale because they are fields and particles simultaneously, whose active fronts collide, interdigitate, collapse or persist long enough to shape the course of proximate events. We eventually encounter them at the macroscale in the formation of patterns, should the processes of decoherence, which average out the specific effects of the quantum realm, not mask the extraordinary properties of the material realm (Al-Khalili & Macfadden, 2014). As systems repeat themselves, they start to shape spaces in particular ways, priming further interactions between excitable molecules that can then make decisions about their configuration and spatial distribution. The patterns that arise from these molecular discourses offer an alternative visualization system to digital computers, and although they are not absolute indicators of

events, they produce the conditions for shaping outcomes.

Yet, analogue systems are not universal computers like digital systems. Owing to their environmental responsiveness, they are deeply influenced by the conditions of their sites.

Drawing on the principle that it is important to decide what is worth “counting” so that it may be sorted, ordered and valued in the context of a site, participants were invited to collect items from each destination according to a particular ruleset. Sometimes the strategy was to select exceptions, at other times to tell a story. At the end of the visit the collections were taken back to the studio where they were grouped and sorted according to the participants’ own rulesets, for example based on the size and shape of objects, their emotional significance, or which sites they had been collected from. Unlike numeric forms of representation that are universalized in terms of their indicated quantity, the actual sorting and ordering of items is a form of pre-computation, where the value systems for forming relationships are contemplated and acknowledged. Since these elements are hyper-local and site sensitive, they could only be read fully in their context, or in relationship to others with which they are grouped.

Indeed, our contemporary modes of valuing were established upon classical taxonomic systems - like Aristotle’s *systema naturae* – which create categories according to their possession of particular characteristics, like the shape and function of different body parts, which are indicative of essential qualities. These were refined during the Enlightenment by Carolus Linnaeus and form the basis for modern classification systems. Yet Linnaeus was prone to changing his mind. In an ongoing process of rationalizing the living world he produced thirteen versions of this book, during which time he erased certain categories such as the *paradoxa* – which were monsters and mythological beasts – casting them into the realms of folklore.

Participants in the site visit were invited to identify objects, substances and atmospheres using a range of collecting systems like photography, drawing, prose and gathering, that would therefore contain the relationships they wanted to invite into the site, or would repel harmful agents. While some materials, such as the ever abundant moss, possessed literal significance in relationship to their sites, other samples were of symbolic value, like newspaper clippings that stood in for a set of desired events and long lost properties. These ecologies, events, memories and histories were given a role, and a voice, in the production of living bricks.



Exaptive Materials  
By Simone Ferracina

During a week-long workshop in Estonia, students were tasked with making bricks (units of design) out of objects and materials found on several sites along the Tallinn lagoon. Whereas materiality is usually mapped onto objects *a posteriori*—as a way to strengthen ideas, perform scripts or pursue intents—we tested the possibility of site-specific and contextual materiality – an expanded notion of site (or site survey) that includes not only local infrastructures, ecologies and relational fabrics, but the very materials available for construction. This practice, suspended between *finding* and *making*, is what constitutes an exaptive approach to materials and design (Ferracina, 2013a).

*Finding* refers both to chance discoveries and to the results of a deliberate search. This internal ambiguity, combined with a voluntary relinquishing of control, fuels our approach. The materials collected by students (twigs, Ken dolls, rope, mud, moss, burnt timber, steel, plastic beer cups, shoes, et cetera) represent not a choice in the traditional sense (the design intent as driver of decisions), but a subjective and spontaneous negotiation of proactive and responsive drives, a mixture of design ambitions (certainty/control) and life itself (experience, memory, the unknown). Biases and interests do persist, illuminate paths and steer designs, yet they are tempered and transformed by reality—by encounters that are unpredictable and upset/exceed all forms of pre-emptive conceptualization and deliberation.

*Making* is often confused with the godly/supra-natural framework of a creation *ex-nihilo*, of a beginning from scratch, either as a way to ensure a maximum degree of potentiality (as opposed to the actuality of individuated forms), or to guarantee the highest levels of authorial clarity and integrity. To the hubris of the genius and his *tabula rasa*, an exaptive approach substitutes openness and the willingness to share and combine intents—to cope and collaborate with agencies that are (admittedly) distributed in space and time. We are not interested in the Simondonian distinction between pre-individual technical systems and individuated technical objects (Simondon, 1964), but in claiming an individuating force that can equally operate on raw materials and on discarded objects, on bark and barbed wire, on shattered glass bottles and salt stalactites, on the lump of clay and on the brick—towards a design ecology that is not scared of objects. What separates this approach from mainstream economic upcycling paradigms (the circular economy, cradle to cradle) is a shift from the regulation of material chemistry, fluidity and performance (the purity of McDonough and Braungart's technical nutrients) (McDonough & Braungart, 2002 & 2013), which operates within an industrial—albeit circular—regime, to an ethics of transformation, hybridity, and persistence that bypasses, hacks and disrupts orthodox modes of extraction, processing, manufacture, control, communication and appropriation. In this sense, it espouses Deleuze's definition of creation as an *act of resistance* (against death, towards the invention of a future people), active either in the form of the work of art or as human endeavour (Deleuze, 1987). An act of resistance is a targeted struggle (resistance against something,

towards preservation), but also a refusal to comply, a refusal to act, a suspension—Bartleby’s “I would prefer not to.” (Melville, 1853); the “right to survive” beyond set roles and purposes (Deleuze, 1997). Here, in the context of the stubbornness of objects vis-à-vis society’s actions, protocols and value systems, is where an introduction of the term ‘exaptation’ can no longer be deferred.

The term was first coined by Stephen Jay Gould and Elisabeth S. Vrba in the 1982 essay “Exaptation, a Missing Term in the Science of Form” (Gould & Vrba, 1982), and introduced a fundamental shift in our understanding of how biological form emerges on an evolutionary scale. Whereas the theory of evolution’s focus on adaptation strengthened the teleological coupling of form to function (natural selection building features for a specific purpose, *ad + aptus*), exaptations identify features evolved autonomously, and subsequently co-opted for a different role by reason of their form (*ex + aptus*). The introduction of this term into architecture and design (Ferracina, 2013a & 2013b) doesn’t only legitimate a rift between form and function (a ‘license to kill’ developer’s spreadsheets), but promotes equipmental suspension as a kind of value, as a deep ecological ethos. The broken hammer, the polystyrene cup, and the ruin can no longer be labelled as ‘waste’ or discarded *tout court*; while they remain gleefully suspended and external to on-going productive ecologies, they represent a new (albeit dormant) material palette, an *abécédaire* that bears the potential for entirely new meanings, spatial languages and ways of inhabiting. This is what marks the difference between an exaptive brick and an art object built with found materials: whereas in the former, suspension is transitory and subject to change (the object belongs to an accessible potentialized field), in the latter, it is permanent and regulated/fixed – the object belongs to a reclusive archive, out of circulation.

### Exaptive Materials

### **Studio work**

Each participant was asked to produce a 100-word description of their living brick, a drawing that described it in relationship to its site or method of construction and the object itself from which these final compositions have been selected.

Anna Maria Järvsalu

Helene-Terese Jürgenson

Alexander Kamelhair



Miia Kraun

Joonas Tanne

Maarja Tüür

Eda Vane

Teele Vântö

Premysl Zhor



## Rachel Armstrong

### Hairy on the inside

The theme of my observations was centered on the transitory spaces between worlds. From the scintillating surfaces of the Pääsküla bog that hurled skies onto the ground and split the light open to reveal inverted, invisible landscapes – to the windows within windows of the Rummu quarry and the dark dereliction of the Kopli housing estate. These sites drew my attention to in-between territories, which invoked the darkness of native forests in which strange encounters; hauntings and secrets lurk and are entangled with Estonian folklore. What are the enduring stories of how these sites are inhabited in the 21<sup>st</sup> century? Could they be places for (re)connection, (re)empowerment and (re)enchantment with the present reality?



We formerly thought black holes were smooth and bald like mountains. Now we know they're hairy on the inside. Once we learned the art of time travel, we found hairy black holes everywhere. Tiny ones formed in the kitchen sink along with dirty crockery, which we turned over like stones; delighted and revolted by the molecular creepy crawlies they unearthed. Sometimes they appeared as shadows that swallowed the geometry of alleyways and sad spaces. Mostly though, we found them in the gaps between each other, crying inconsolably behind hardened hearts and minds, which could not escape the rot of disillusionment.

~~[[100 words]]~~

**Three angels dancing**

The angel would like to stay, awaken the dead, and make whole what has been smashed. But a storm is blowing from Paradise; it has got caught in his wings with such violence that the angel can no longer close them. The storm irresistibly propels him into the future to which his back is turned, while the pile of debris before him grows skyward. This storm is what we call progress.

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1. Walter Benjamin on *Angelus Novus* by Paul Klee

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Angels can fly because they take themselves lightly; devils fall because of their gravity.

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- G. K. Chesterton

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It's not about you.

They say you are happier in company. But that is when you most incline to curtail my freedom.

When the storm blows, I can no longer close my wings.

Flying brings violence and destruction. This is why you must be locked up or fixed to the ground.

It's not about you.

Nor about me.

I fly backwards to the future, while earth's detritus rises and recedes.

I inhabit the site of non-orientation – where angels blend brickdust in anti-gravity.

When the time comes to break us up, they'll surely pile us with our kin. Won't they?

That's when I'll pick you up, and hold to my three hearts the tiny, beating tornadoes within.

\*

Rolf Hughes



## Accelerations

The gatherer collects a vegetal bestiary of odd twigs, bark, dried-up bushes, and the fallen interfaces between trunks and branches. ~~Weaved~~Woven together, these dead limbs form a new hybrid beast—a brideless bouquet whose fibrous matter refuses subsuming into broad industrial categories (timber, wood), while also resisting the glorifying temptations of the art object and its pedestals (the readymade, ~~the~~'-objet trouvé). Rather, this assemblage, held together by black thread à la Judith Scott ~~[footnote this reference please!]~~, aspires to a more transitory status, what we might call “objecthood for hire.”

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~~The~~This designer will not name it, but sets it ablaze and warms ~~his~~ hands to it. Yet, he doesn't want to wipe it out entirely. He believes that forms do not crumble into ashes, but persist—transformed and translated across generations, like the traces imprinted by Kalevipoeg on the Estonian landscape. “I prepare not things for others to use, but for others to change” he reflects, placing the bundle in a found leather boot and filling it with plaster.

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The butcher skins the animal gently, with a clean cut along the seams. He peels the hide off the cast, and hardened organs begin to spill out, revealing tiny swings and cave-like landscapes framed by white veins and leather. Postcards of ephemeral terrains, between the cow and beef.

The skin is off, and a pale boot-like body patiently waits for a spark to warm its ligneous arteries—and be able to walk. A spider climbs to its peak and begins to spin.

Commented [RH1]: Nice text Simone – love the last line!



## Summary

By Rachel Armstrong, Simone Ferracina & Rolf Hughes

Using radical modes of experiment that drew from multiple disciplinary practices and forms of knowledge, the living brick workshop invoked the agency of “demons”, the invisible and disobedient realms of life, to challenge the intoxicating Enlightenment ideal of control and perfection. Indeed, participants are introduced to the possibility of a world of exceptions where spaces and inhabitants may rapidly respond to changing circumstances.

By engaging techniques of experimental architecture, participants could ally with the forces of the natural realm to produce a platform and laboratory (in the field, or workshop) that invited the participation of unconventional agents, which were capable of transforming the character of spaces by linking them with their modes of inhabitation. In this manner living bricks were more than “just” objects, but acquired some of the properties of dissipative structures – whereby their influences extend beyond the apparent object boundary and begin to support lifelike events. The capacity to produce such unconventional prototypes may equip participants with an expanded knowledge and a novel toolset for inventing and synthesizing alternative protocols for designing and inhabiting space.

Although we have benefited immensely from millennia of structural systems that function as inert barriers, it is urgent that we find ways of reconnecting with one another and with the natural world. Indeed, current political, economic and social structures, coupled with extreme environmental conditions like such as flooding, pollution, climate fluctuations and political upheaval, are set to provoke further migrations and conflict acrossbetween people. There is thus an urgent need to re-imagine and re-purpose the building blocks for the design and construction of our cities as tools that do not separate and segregate, but invite tolerance, community and embraces. No longer passive observers of divisions between societies, the infrastructures of the built environment must open up possibilities for vibrancy, diversity, diplomacy, dignity, fluidity, collaboration and creativity. In combining living metabolisms with structural systems through the prototyping of living bricks, designers access a greater portfolio of approaches for our ongoing survival, one that is granted agency without relying on the generosity of others. Embodying the dynamic capabilities of the natural world, living bricks are lively and responsive bodies that are capable of change, of processing their environment, of telling stories and of supporting the ecologies and systems that nurture our life on the planet.



## **Biographies**

### **The workshop was conceived and run by the Experimental Architecture Group:**

**Rachel Armstrong:** Professor of Experimental Architecture, School of Architecture, Planning & Landscape, Newcastle University:

Rachel is Professor of Experimental Architecture at the School of Architecture, Planning and Landscape, Newcastle University, a Rising Waters II Fellow with the Robert Rauschenberg Foundation (April-May 2016), TWOTY futurist 2015, Fellow of the British Interplanetary Society and a 2010 Senior TED Fellow. She is a "sustainability" innovator who investigates a new approach to building materials called 'living architecture' that suggests it is possible for our buildings to share some of the properties of living systems. She collaboratively works across disciplines to build and develop prototypes that couple the computational properties of the natural world with the productivity of soils. She is coordinator for the €3.2m *Living Architecture* project, which is an ongoing collaboration of experts from the universities of Newcastle, UK, the West of England (UWE Bristol), Trento, Italy, the Spanish National Research Council in Madrid, LIQUIFER Systems Group, Vienna, Austria and EXPLORA, Venice, Italy that began in April 2016 and runs to April 2019. It is envisioned as a next-generation, selectively, programmable bioreactor that is capable of extracting valuable resources from sunlight, wastewater and air and in turn, generating oxygen, proteins and biomass. Conceived as a freestanding partition it is composed of bioreactor building blocks (microbial fuel cell, algae bioreactor and a genetically modified processor), which are being developed as standardized building segments, or bricks. Living Architecture uses the standard principles of both photo bioreactor and microbial fuel cell technologies, which are adapted to and combined into a single, sequential hybrid bioreactor system so they will work synergistically together to clean wastewater, generate oxygen, provide electrical power and generate useable biomass (fertilizer).

**Simone Ferracina: Research Assistant,** School of Architecture, Planning & Landscape, Newcastle University; [simone.ferracina@ncl.ac.uk](mailto:simone.ferracina@ncl.ac.uk)

Simone leads the *Living Architecture* project and is a researcher at the School of Architecture, Planning and Landscape, Newcastle University. With Rachel Armstrong, his work focuses on Living Architecture, a EU-funded project that operates at the intersection of design, building construction, bio-energy and synthetic biology. He is also a PhD candidate in Philosophy, Art and Critical Thought at the European Graduate School in Saas-Fee, where his research, under the supervision of philosopher Graham Harman, aims to theorize radical modes of co-authorship and the reactivation of wastes through design, beyond current up-cycling paradigms. Simone is the founder and editor of the architecture magazine *Organs Everywhere* and the co-editor (with Rachel Armstrong) of the book *Unconventional Computing: Design Methods for Adaptive Architecture* (Riverside Architectural Press). He has published speculative projects and essays in 306090, Kerb, Volume, Continent and Thresholds, among others. Prior to

joining Newcastle University. Simone was, for over a decade, an Associate and Project Director at Richard Meier & Partners Architects in New York City.

**Rolf Hughes:** Research Associate, School of Architecture, Planning & Landscape, Newcastle University; [rolf.hughes@ncl.ac.uk](mailto:rolf.hughes@ncl.ac.uk)

Rolf is Research Associate and Director of Artistic Research Practices within the field of Experimental Architecture at Newcastle University. He was previously Head of Research as well as Professor of Artistic Research at Stockholm University of the Arts (inaugurated 2014), and Vice President of the international Society for Artistic Research. A prose poet, essayist, and researcher in innovative forms of artistic and transdisciplinary practices over more than twenty years, Hughes holds a First Class degree in English and Related Literature (University of York), an MA (with Distinction) in Creative Writing and the first ever PhD, in Creative and Critical Writing funded by the British Academy from the University of East Anglia, UK. Working across arts, crafts and design disciplines, he has been expert advisor and reviewer in artistic research for a number of national research funding agencies, and was Guest Professor in Design Theory and Practice-Based Research at Konstfack University College of Arts, Crafts and Design and Senior Professor in Research Design at Sint-Lucas School of Architecture (KU-Leuven, Belgium), where he helped create and develop an international, design-led PhD. programme (2007–2013). He has published extensively on artistic, design-led and practice-based research, and has both supervised and examined PhD dissertations across architecture, art, craft, design, and the performing arts since 2000. In his artistic and critical practice, he explores writing, genre, and interdisciplinarity – extending essay and poetic forms alike – the concept of exposition in artistic research, and experiments in what he has termed “the art(s) of the impossible”.

He is (with Rachel Armstrong and Olle Strandberg) co-founder of Radical Circus (2016), a group dedicated to radical experiments in artistic research using contemporary circus arts. Alongside Rachel Armstrong and Simone Ferracina, he is a member of the Experimental Architecture Group (EAG), exploring the contribution of artistic research methods to the field of experimental architecture.

#### **Workshop organiser:**

**Kristi Grišakov:** Head of Landscape Architecture, Tallinn Technical University; [kristi.grisakov@ttu.ee](mailto:kristi.grisakov@ttu.ee).

Kristi is the Head of Landscape architecture and environmental management program at Tallinn Technical University. She is currently a researcher and a doctoral student in Aalto University Land Use Planning and Urban Studies Group. Her work focuses on the application of scenario thinking and storytelling in strategic urban planning. In the center of her work about the future of cities is the story of Helsinki-Tallinn - a twin city in the making. Kristi is the founder of urban think-tank Väike Vasak Käsi that is working on applying scenario thinking and storytelling into numerous urban planning and envisioning projects in both

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Estonia and Finland. She is also an urban activist and founder of group “Pro Maritime City”.

**Lecturers for the workshop:**

**Rolf Hughes:** Research Associate, School of Architecture, Planning & Landscape, Newcastle University; [rolf.hughes@ncl.ac.uk](mailto:rolf.hughes@ncl.ac.uk)

Tiina Peil is a historical geographer interested in interactions of people and nature over time. Her research has focused on the Estonian islands and coastal culture as well as landscape; history of environmental ideas and the practices of geography (mapping and fieldwork).

Recent research themes include urban (environmental)

history; travel and tourism and their impact on the local environment connected with the issues of cultural and natural heritage, and local resource systems (ecosystem services). Currently she is working together with art historians, anthropologists, and ecologists to find resilient and inventive ways for a more sustainable world focusing on the relation between arts, space, place, and environmental practice.

- She has a degree in biogeography from University of Tartu (1990) and PhD in human geography from Stockholm University (1999). She has also worked with environmental applied projects around the Baltic, hence being involved in developing environmental policies as well as following their application in various settings. Her academic career includes positions of a post-doc at NTNU in Trondheim, Norway and the Centre of Advanced Studies, Oslo (2003-2005), a visiting scholar at the British Royal Academy (2002), a senior researcher at Tallinn University and the Centre of Excellence in Cultural Theory (2006-2015), and currently a senior researcher at Södertörn University, Sweden.

**Hannes Tõnisson, Senior Research Fellow, Institute of Ecology, Tallinn University; [hannes.tonisson@tlu.ee](mailto:hannes.tonisson@tlu.ee).**

Hannes Tõnisson is senior researcher at Tallinn University, Institute of Ecology. He has PhD in ecology and his main research concerns are coastal evolution and the effect of extreme events on coastal evolution. He has studied recent extreme events and changes in historical storminess and how these have influenced coastal evolution.

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